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DETAILED ACTION

Specification

1. The incorporation of essential material in the specification by reference to an unpublished U.S. application, foreign application or patent, or to a publication is improper. Applicant is required to amend the disclosure to include the material incorporated by reference, if the material is relied upon to overcome any objection, rejection, or other requirement imposed by the Office. The amendment must be accompanied by a statement executed by the applicant, or a practitioner representing the applicant, stating that the material being inserted is the material previously incorporated by reference and that the amendment contains no new matter. 37 CFR 1.57(f). The **priority claim** (foreign priority or 371 of PCT) has to be specified either in the beginning of the specification or ADS. The applicant submits a mere copy of WIPO for both specification and claims and drawing, which do not have priority claim. The examiner recommends a separate set of specification and claims and drawing while WIPO documents are made as support of 371 of PCT.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. **Claims 1-7, and 10** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter

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which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding independent **claims 1 and 10**, they recite "determining the size of said buffer according to said bit rate". However, there is no support from the specification regarding this subject. The closest the examiner can think of are the Buffer_Pointer and Current_Pointer in page 10 of the specification. Both of them are not clear about what they mean, because Buffer_Pointer is not defined, and Current_Pointer is not clear whether it is a buffer fullness at the current (Current_Pointer position, pp.9, line 13-15) or the range defined by the inequality equation (pp.10, line 16-17) which includes Buffer_Pointer. Specially the inequality equation (pp.10, line 16-17) is confusing whether the range is a definition of the current buffer position or the condition which the current buffer position has to satisfy. The examiner interprets it as latter.

Regarding **claims 2-7**, they are dependent on the independent claim 1. Therefore, they are rejected too.

Regarding **claim 2**, it recites "Delta_Buffer_Pointer". The specification discloses that it is defined based on the input rate and constant (pp.10, line 13-20). However, the specification is not clear how to specifically determine it.

Regarding **claim 3**, it recites "...if the "Current_Pointer" is within said range, recording a plurality of measurements of the time taken for a message from the server's transmitter to the client's receiver and back again to the transmitter (RTT); and

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if the "Current_Pointer" is within said range, increasing the bit rate". However, it is not clear how RTT measurements are incorporated in the second (later) Current_Pointer. Also it is not clear about "the range". If it refers the range in the definition of the Current_Pointer (pp.10, line 16-17), the Current_Pointer is always in the range.

Regarding **claim 4**, it recites "...if the "Current_Pointer" is lower than the increased current bit rate range, reducing the bit rate ", however "the increased current bit rate range" is not disclosed in the specification. Also, "reducing bit rate" for the above condition is contrary to the well known in the art. If the buffer fullness (Current_Pointer) is lower, it is likely to increase the bit rate because there is more usable space in the buffer.

Regarding **claim 5**, it recites "determining whether the "Current_Pointer" is within the range appropriate to the current bit rate; and if the "Current_Pointer" is lower than said range, reducing the bit rate ", however "the range appropriated to the current bit rate" is not disclosed in the specification. Also, "reducing bit rate" for the above condition is contrary to the well known in the art. If the buffer fullness (Current_Pointer) is lower, it is likely to increase the bit rate because there is more usable space in the buffer.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. **Claims 1-7 and 10** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding **claims 1 and 10**, they recite "inputting the bit rate desired for outputting the received video stream into a buffer". However, it is not clear whether the bit rate is input or output bitrate with respect to the buffer. Therefore, the claims are indefinite.

Regarding **claims 2-7**, they are dependent on the independent claim 1. Therefore, they are rejected too.

Regarding **claims 3 and 5**, they recite the limitation "said step of varying" in claim 1. There is insufficient antecedent basis for this limitation in the claims.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. **Claims 1-2, 5-6, and 8** are rejected under 35 U.S.C. 103(a) as being unpatentable over Chiang (US 6,243,497) (hereafter referenced as Chiang) in view of Zhang (US 2002/0,054,578) (hereafter referenced as Zhang).

Regarding **claim 1**, Chiang discloses Apparatus and Method for Optimizing the Rate Control in a Coding System. Specifically Chiang discloses A method for generating video streaming (Fig.1), the method including the steps of:
inputting the bit rate (target number of bits, col.5, line 64) desired for outputting the

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received video stream into a buffer (Buffer 190, Fig.1);
determining the size of said buffer (Buffer fullness is updated, col.9, line 56-61)
according to said bit rate;
adjusting said bit rate (target bit rate is adjusted, col.7, line 58-60); and
repeating the steps (determining and adjusting are repeated for each frame in Chiang, col.7, line 30- col.8, line 67) of determining and adjusting thereby to output the video stream at the highest bit rate consistent with optimum levels of quality (maintaining a uniform visual quality, col.5, 8-9). However, Chiang fails to disclose a *pre-determined period of delay*.

In the analogous field of view, Zhang discloses Channel and Quality of Service Adaptation for Multimedia over Wireless Network. Specifically Zhang discloses that low delay is required, for the purpose of real time media transmission (paragraph 5).

Therefore, given this teaching, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Chiang by providing *predetermined period of low delay*, for the purpose of real time media transmission. The Chiang method, incorporating the Zhang predetermined low delay, has all the features of claim 1.

Regarding **claim 2**, Chiang and Zhang discloses everything claimed as applied above (see claim 1). Chiang further discloses wherein said step of determining comprises the step of: defining the "Current_Pointer" position (Eq.11); wherein "Buffer Pointer" - "Delta Buffer Pointer" < "Current Pointer" < "Buffer Pointer" +

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"Delta Buffer Pointer" (Buffer fullness must not exceed 90% of the buffer capacity, col.8, line 16-17, must not fall below 10%, col.8, line 25-27).

Regarding **claim 5**, Chiang and Zhang discloses everything claimed as applied above (see claim 1). Chiang further discloses wherein said step of varying comprises the steps of: determining whether the "Current_Pointer" is within the range (half full of buffer, col.8, line 1-4) appropriate to the current bit rate; and if the "Current_Pointer" is lower than said range (if buffer is less than half full), reducing the bit rate (target bit rate is increased, col.8. line 1-4).

Regarding **claim 6**, the Chiang method, incorporating the Zhang predetermined low delay, as applied to claim 1, discloses further comprising the steps of: assigning a header (inherent in Chiang: MPEG compliance encoder, col.2, line 40-41, because the MPEG video bitstream has a frame header) to a first frame of a series of frames of a video stream to be encoded; allocating a period of time (incorporating the Zhang predetermined low delay) to said first frame before encoding, said period of time corresponding to the delay time of said first frame; compressing (Chiang: MPEG compliance encoder, col.2, line 40-41) said first frame; and repeating said steps (determining and adjusting are repeated for each frame in Chiang, col.7, line 30- col.8, line 67) of assigning, allocating and compressing for each subsequent frame to be encoded.

Regarding **claim 8**, claim 6 has all the features of claim 8. Therefore, it is rejected for the same reason as claim 6.

8. **Claims 3-4, 7, and 9-10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Chiang in view of Zhang, and further in view of Tran (US 2002/0,194,609) (hereafter referenced as Tran).

Regarding **claim 3**, Chiang and Zhang discloses everything claimed as applied above (see claim 1). Chiang further discloses wherein said step of varying comprises the steps of: determining whether the "Current_Pointer" is within the range (Chiang: buffer is less than half full, col.8, line 1-4) appropriate to the current bit rate; and if the "Current_Pointer" is within said range (Chiang: if buffer is less than half full, col.8, line 1-4), increasing the bit rate (target bit rate is increased, col.8, line 1-4). However, Chiang and Zhang fail to disclose recording a plurality of measurements of the time taken for a message from the server's transmitter to the client's receiver and back again to the transmitter (RTT).

In the analogous field of view, Tran discloses Video Client with Dynamically Allocable Video Buffer for Efficient Streaming Video. Specifically Zhang discloses recording a plurality of measurements of the time taken for a message from the server's transmitter to the client's receiver and back again to the transmitter (RTT) (Round Trip Time, col.5, last 3 lines - col.6, line 1-4), in order to adjust buffer size (col.6, line 1-4).

Therefore, given this teaching, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Chiang and Zhang by providing the dynamic buffer at the client, in order to reduce the communication risk . The Chiang

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method, incorporating the Zhang predetermined low delay, and further incorporating the Tran dynamic buffer at the client based on RTT, has all the features of claim 3.

Regarding **claim 4**, Chiang and Zhang and Tran discloses everything claimed as applied above (see claim 4). Chiang further discloses wherein said step of varying comprises the steps of: if the "Current_Pointer" is lower than said range (if buffer is less than half full), reducing the bit rate (target bit rate is increased, col.8. line 1-4).

Regarding **claim 7**, Chiang and Zhang discloses everything claimed as applied above (see claim 6). However, Chiang and Zhang fail to disclose further comprising the steps of: transmitting said encoded series of frames to a buffer located at the client site; adjusting the size of said buffer in response to a dynamically varying bandwidth.

In the analogous field of view, Tran discloses Video Client with Dynamically Allocable Video Buffer for Efficient Streaming Video. Specifically Zhang discloses the steps of: transmitting said encoded series of frames (Fig.1 Video server-client system) to a buffer (client buffer, paragraph 38) located at the client site; adjusting the size of said buffer (increase buffer size, paragraph 38, de-allocate portion of buffer, paragraph 42) in response to a dynamically varying bandwidth, in order to reduce the communication risk (paragraph 12).

Therefore, given this teaching, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Chiang and Zhang by providing the dynamic buffer at the client, in order to reduce the communication risk . The Chiang method, incorporating the Zhang predetermined low delay, and further incorporating the Tran dynamic buffer at the client has all the features of claim 7.

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Regarding **claim 9**, claim 7 has all the features of claim 9. Therefore, it is rejected for the same reason as claim 7.

Regarding **claim 10**, claim 7 has all the features of claim 10. Therefore, it is rejected for the same reason as claim 7.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to HEE-YONG KIM whose telephone number is (571)270-3669. The examiner can normally be reached on Monday-Thursday, 8:00am-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha Banks-Harold can be reached on 571-272-7905. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/HEE-YONG KIM/
Examiner, Art Unit 2621

/Andy S. Rao/
Primary Examiner, Art Unit 2621
June 7, 2010